GDS Associates, Inc.
ENGINEERS & CONSULTANTS

CITY OF DURHAM

PRESENTED BY GDS ASSOCIATES, INC.

DURHAM CITY COUNCIL PRESENTATION

2021 Carbon Neutrality & Renewable Energy Action Plan

October 18, 2021

CITY OF DURHAM GOALS

2019

Durham City Council Approves Resolution

To transition **City Operations** to
- A supply of 80% renewable energy by 2030
- Achieve carbon neutrality in 2040
- Reach 100% renewable energy sourcing by 2050

2030

50% GHG Reductions 80% Renewable Energy Sourcing

- Durham achieves 50% reduction in Greenhouse Gas (GHG) Emissions in City Operations by 2030 from the goal established in 2007 City of Durham and Durham County Local Action Plan for Emission Reductions
- Durham achieves 80% renewable energy sourcing for City Operations by 2030

2040

Achieve Carbon Neutrality in City Operations

- Durham achieves carbon neutrality in City Operations by 2040

2050

100% Renewable Energy Sourcing

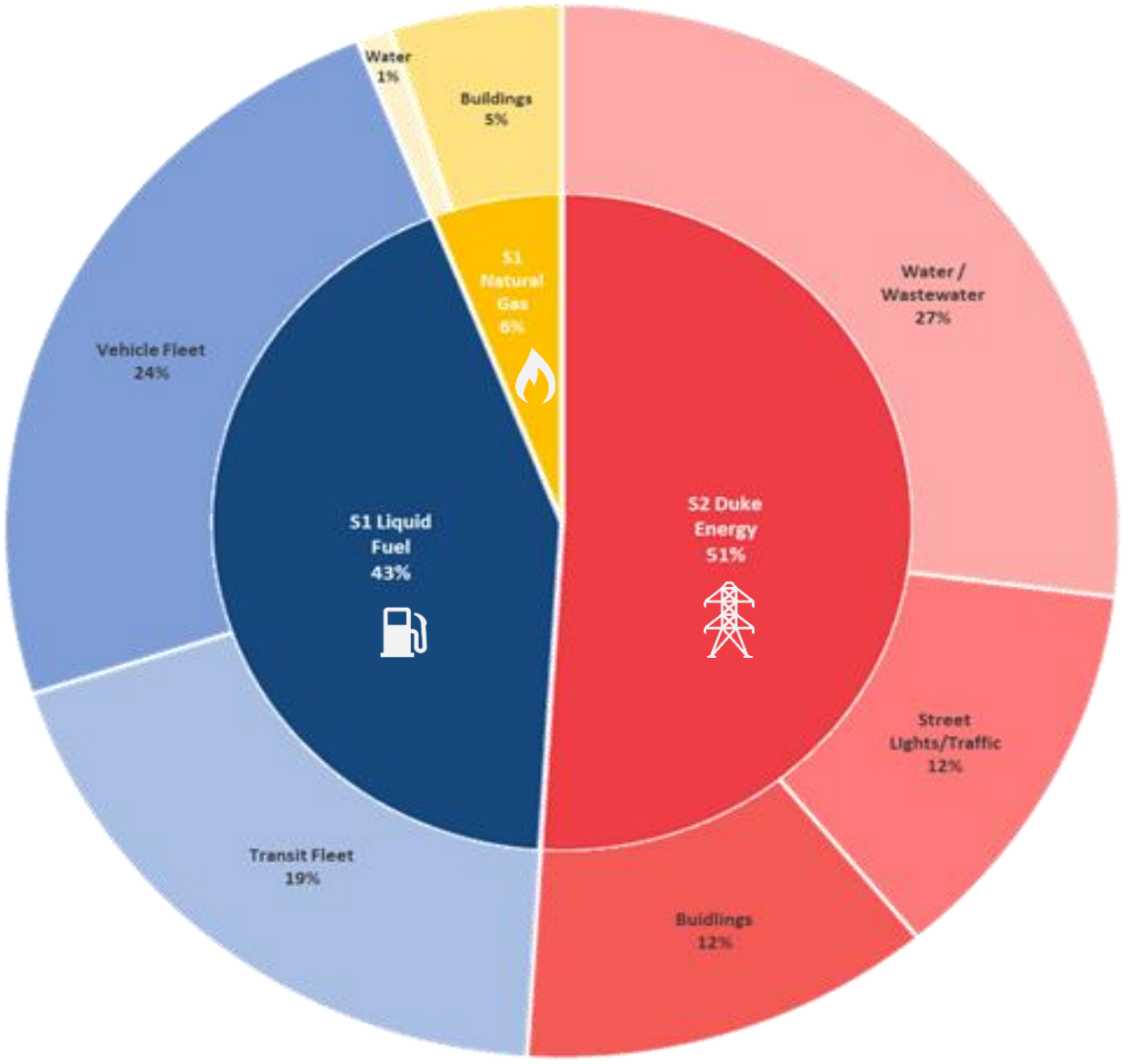
- Durham achieves 100% renewable energy sourcing for City Operations by 2050

CARBON NEUTRALITY & RENEWABLE ENERGY ACTION PLAN

- **Carbon Neutrality Plan**
  - *Energy Efficiency Strategy*
  - *Electrification Strategy*
  - *Renewable Energy Strategy*
  - *Innovative Practices and Partnerships*
  - *Financial Considerations*
  - *Policy Assessment*
- **Renewable Energy Plan**
- **Implementation Recommendations**

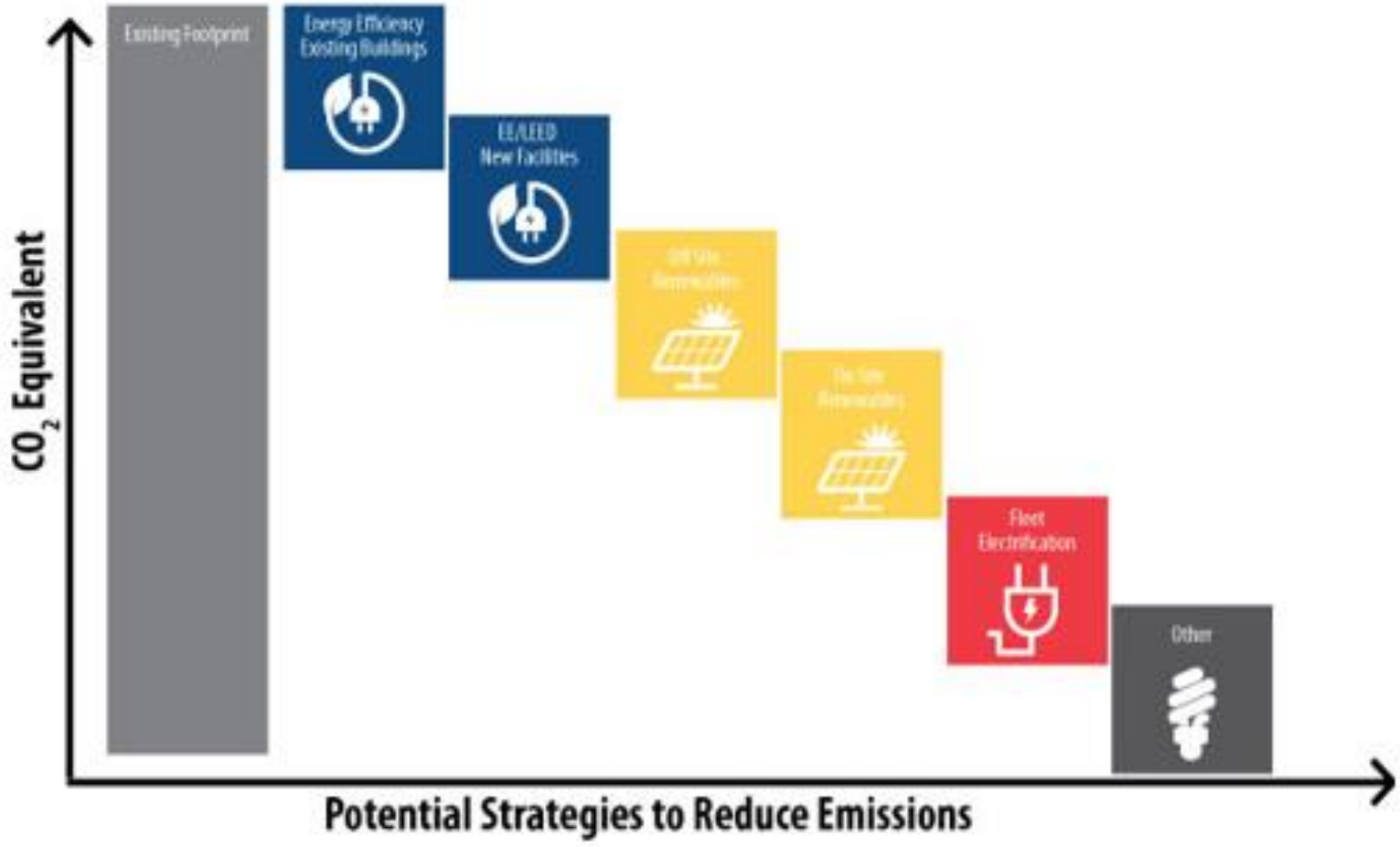
DURHAM 2020 GREENHOUSE GASES (GHG) EMISSIONS

- **Scope 1**
  - *Vehicle Fleet*
  - *Transit Fleet*
  - *Natural Gas - Facilities*
- **Scope 2**
  - *Water/Wastewater*
  - *Streetlights and Traffic Signals*
  - *Electricity - Buildings*



STRATEGIES TO ACHIEVE GOALS

1. Maximize **Energy Efficiency** in City Buildings and Operations
2. Expand **Renewable Energy** Generation and Procurement
3. Increase **Electrification** of City Buildings and Vehicles (Fleet & Transit)
4. Establish Innovative Practices and Partnerships



#1 - ENERGY EFFICIENCY

- **Existing Facility Initiatives**
  - *8% of GHG Reductions*
  - *ASHRAE Audits*
  - *Facility Retrofits*
  - *Energy Management*
- **New Construction Initiatives**
  - *High Performance “Green” Building Standard*
  - *Include renewables, monitoring, and EV charging*
- **Streetlight LED conversion**
  - *4% of GHG Reductions*

#2 - RENEWABLE ENERGY

- **On-site**
  - *8% of GHG Reductions*
  - *Solar – Rooftop and Landfill*
  - *Biogas Combined Heat & Power (CHP)*
  - *Geothermal*
- **Off-site**
  - *34% of GHG Reductions*
  - *Large Scale Solar Procurement [Duke Energy Green Source Advantage Program (GSA)]*

#3 – ELECTRIFICATION

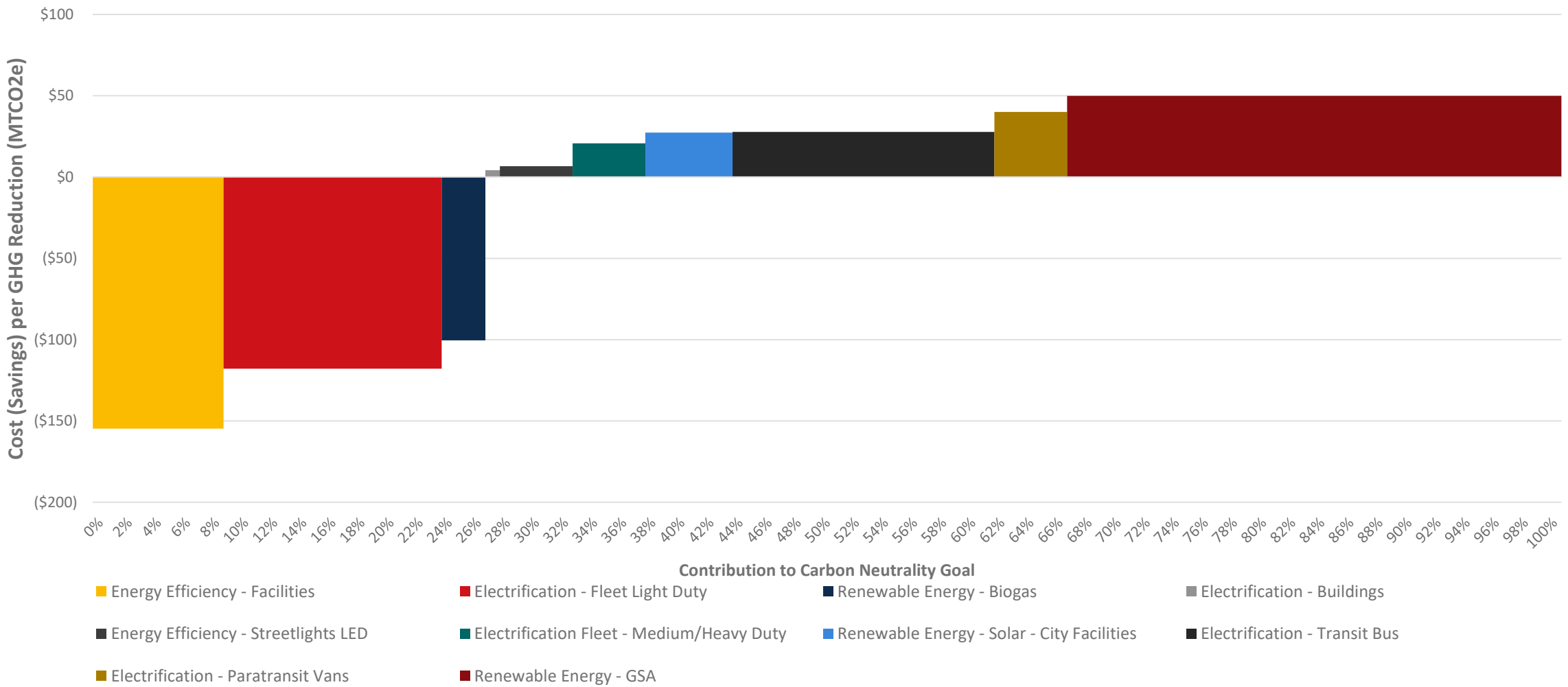
Transportation Electrification (44% of GHG Reductions)

- **Transit Buses**
  - *17% of GHG Reductions*
  - *57 Buses*
- **Light Duty (Cars & Trucks)**
  - *15% of GHG Reductions*
  - *671 Passenger Cars*
  - *366 Light Duty Trucks*
- **Paratransit Vehicles (Vans)**
  - *6% of GHG Reductions*
  - *53 Paratransit Vehicles*
- **Medium Duty/Heavy Duty (MD/HD)**
  - *6% of GHG Reductions*
  - *45 Sanitation Trucks*

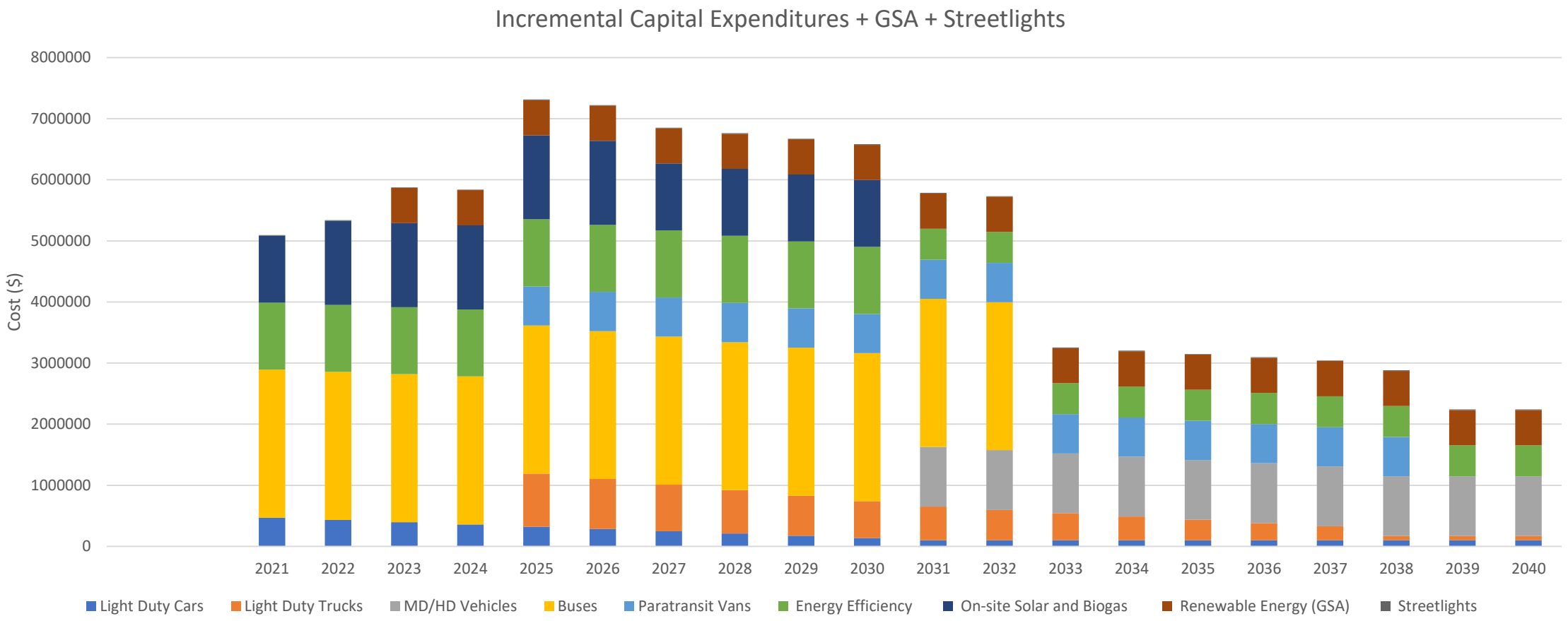
Building Electrification

- **Building Retrofits**
  - *2% of GHG Reductions*

2040 GHG SUPPLY CURVE



INCREMENTAL EXPENDITURES



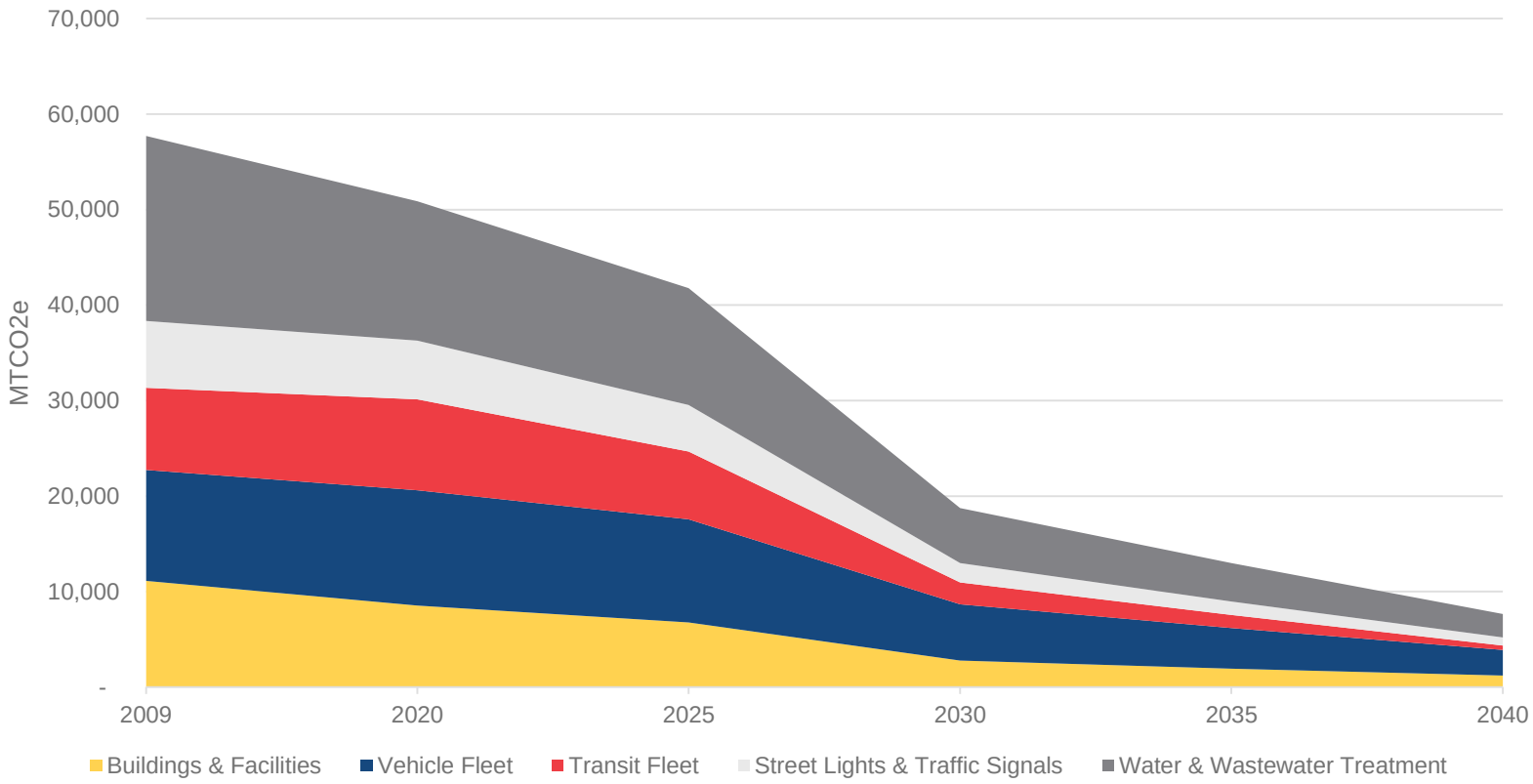
INCREMENTAL EXPENDITURES

- **Pursue All Funding Options – Grants, Loans, Incentives, Rebates, etc.**
  - *Federal*
  - *State*
  - *Utility*
  - *Philanthropic*
  - *Other*
- **Evaluate Financing Mechanisms**
  - *Lease versus Buy Options*
  - *Public/Private Partnerships*
  - *Green Infrastructure Bonds*
  - *Other*
- **Monitor Policy Impacts**

ACTION ITEMS	2021 - 2040 Total Cap Ex	Total Savings or (Cost)	Net Cost or (Savings)
INCREMENTAL CAPITAL ACTION ITEMS			
Transportation Electrification			
Light Duty Cars & Trucks	$ 11,385,650	$ 17,453,980	$ (6,068,330)
MD/HD Vehicles - Sanitation Truck	$ 9,787,500	$ 9,383,490	$ 404,010
Transit Buses	$ 29,070,000	$ 27,093,072	$ 1,976,928
Paratransit Vehicles (Vans)	$ 8,983,500	$ 8,433,800	$ 549,700
Building Electrification	$ 320,891	$ 224,070	$ 96,821
Energy Efficiency	$ 16,054,163	$ 19,683,594	$ (3,629,431)
Renewable Energy			
Solar - City Facilities	$ 10,950,464	$ 9,854,280	$ 1,096,184
Biogas	$ 1,400,000	$ 2,888,220	$ (1,488,220)
Incremental Capital Expenditures	**$ 87,952,168**	**$ 95,014,506**	**$ (7,062,338)**
INCREMENTAL NON CAPITAL ACTION ITEMS			
Streelight LED Conversion	$ -	$ (195,500)	$ 195,500
Renewable Energy (Duke Energy GSA)	$ -	$ (10,362,420)	$ 10,362,420
	$ -	**$ (10,557,920)**	**$ 10,557,920**
TOTAL INCREMENTAL EXPENDITURES	**$ 87,952,168**	**$ 84,456,586**	**$ 4,646,962**

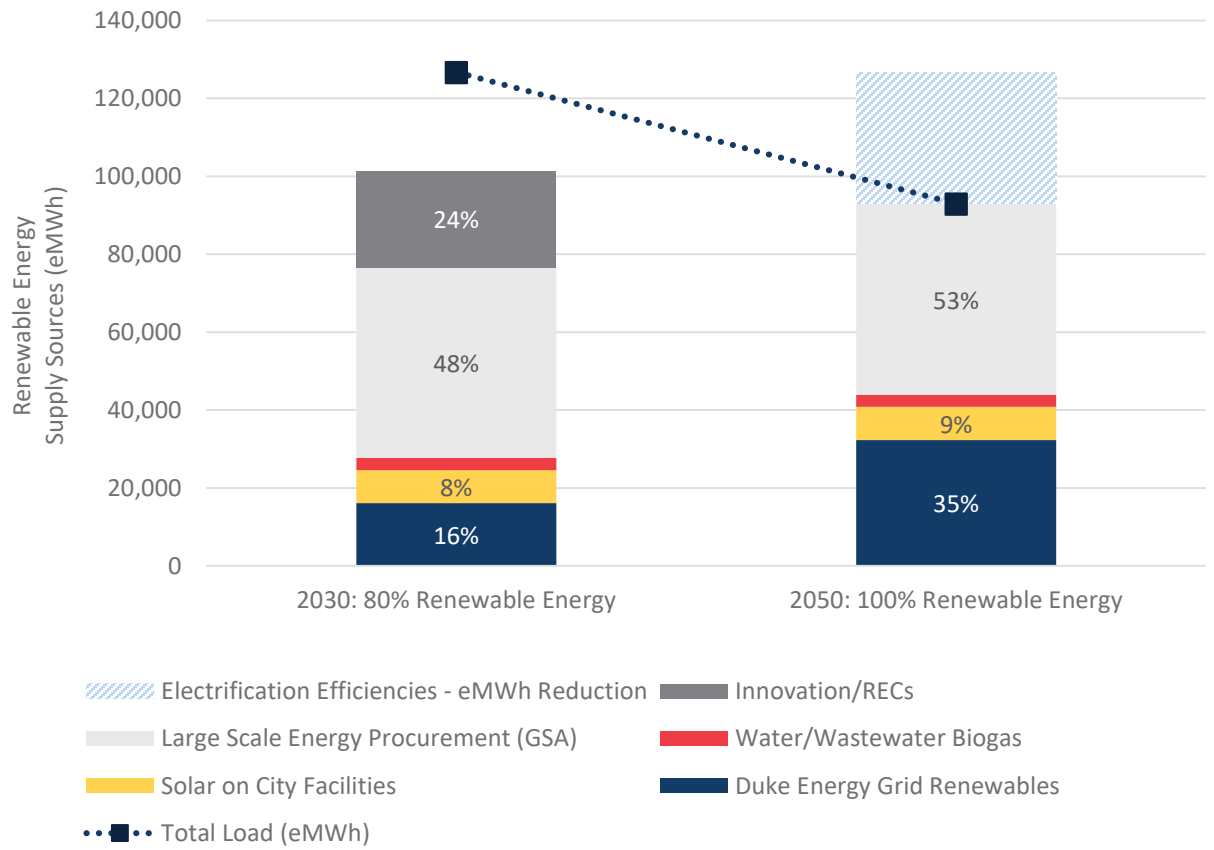
CARBON NEUTRALITY GOAL

- Achieve 50% reduction by 2030
- Achieve 90% reduction by 2040
- Expect Technology, Economic, and Policy changes to impact plan

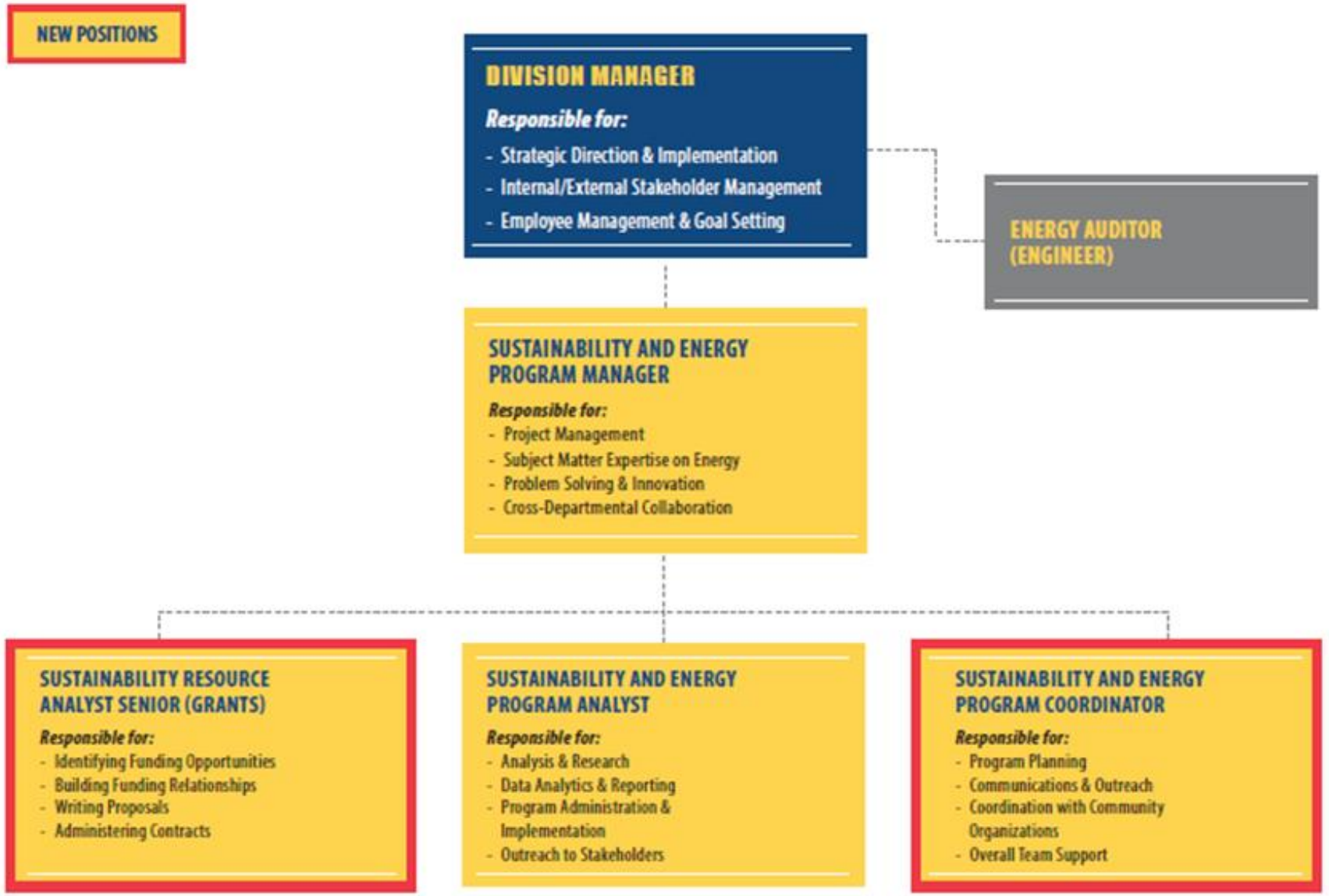


RENEWABLE ENERGY GOAL

- Achieve 80% Renewable Energy Supply by 2030
- Achieve 100% Renewable Energy Supply by 2050



SUSTAINABILITY STAFFING



EAB SURVEY QUOTE

“Everything Durham does, moving forward, should keep in mind environmental justice. The disadvantaged and marginalized should always be kept at the forefront of whatever plans are made -- we don't just want a greener future, we want a better future, for everyone.”

- EAB Survey Respondent


QUESTIONS